B. Claim Rejections

Claim 12 was rejected under 35 U.S.C. § 112 as being indefinite. Originally filed claim 12 is reproduced below for convenience.

> 12. The sewing thread of claim 1 further characterized in that the staple fiber is composed of staple less than about 1.5 denier/filament.

Contrary to the Exmainer's belief, this claim is not directed to the "length" of the staple fibers because that characteristic is addressed in Claim 11. Claim 12 is in fact directed to the degree of fineness of the individual staple fibers. Fineness is expressed as denier (also known as tex size) and is defined as shown below, where it is clearly stated that it is an approproate measure for staple fiber.

> **DENIER:** A weight-per-unit-length measure of any linear material. Officially, it is the number of unit weights of 0.05 grams per 450-meter length. This is numerically equal to the weight in grams of 9,000 meters of the material. Denier is a direct numbering system in which the lower numbers represent the finer sizes and the higher numbers the coarser sizes. In the U.S., the denier system is used for numbering filament yarns (except glass), manufactured fiber staple (but not spun yarns), and tow. In most countries outside the U.S., the denier system has been replaced by the tex system. The following denier terms are in use:

The above defintion is taken directly from the Dictionary of Fiber & Textile Technology, 1989, a copy of the relevant sections are included as an attachment hereto. Moreover, it is also correct to characterize the denier of individual staple fibers by the unit measure "denier per filament." As the definition below indicates this unit measure is appropriate for individual staple fibers, exactly as recited in claim 12.

> **Denier per Filament (dpf):** The denier of an individual continuous filament or an individual staple fiber if it were continuous. In filament yarns, it is the yarn denier divided by the number of filaments.

(see attached - Dictionary of Fiber & Textile Technology, 1989). Therefore, in light of these accepted industry defintions, Applicant respectfully submits that originally filed claim 12 is not

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indefinite and the rejection should therefore be withdrawn.

Claims 1-3 and 7-14 were rejected under 35 U.S.C. § 103(e) as being obvious over Hatch in view of Smith et al. Applicant submits that 1) the combination of references is improper because Smith et al. is non-analagous art, and 2) even if the combination was proper, a *prima facie* case of obviousness has not been established because the combination of references does not teach each and every element of the claimed invention.

First, Applicant believes a summary of the claimed invention will be helpful. Using claim 1 as an example, Applicant's invention is directed to only a 2-ply sewing thread composed of 2 yarns, where at least one of the yarns in the composite comprises 100% staple fibers, otherwise known as a "spun yarn." The second yarn in the relied composite can be a spun yarn or any other type of yarn known to those skilled in the art of developing sewing thread. The first or single spun yarn has a twist imparted to it before it is plied with the second yarn to form the composite. This twist is in a particular drection, for example, in the **S** direction. The twisted spun yarn and the other yarn are then ply twisted together **N** turns per inch to form the 2-ply composite. The twist imparted to the composite of two yarns is in the opposite direction of the twist of the single spun yarn. Thus, following the same example, the composite would be twisted in **Z** direction. More specifically, the single spun yarn has a twist in the opposite direction of the 2-ply composite twist equal to $\geq$ **4+N** turns per inch. Therefore, if the single spun yarn is twisted 10 times in the **S** direction, then the 2-ply composite will be twisted in the opposite or **Z** direction $\leq$ 6 turns per inch.

Turning next to outstanding rejections and the two references cited by the Examiner, the primary reference, Hatch, describes only conventional plied yarns formed from yarns composed

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of staple fibers. Although it teaches that two or more spun yarns may be twisted together in the opposite direction of twist than that of the individual single spun yarns, there is absolutely ***no*** disclosure that the single spun yarns have a ***higher*** amount of twist than the plied composite. Indeed, Hatch actually teaches away from Applicant's invention by disclosing that the plied composite should have the conventionally known "balanced twist." As the Examiner recognized, Hatch is completely silent as to the number turns per inch of either the individual spun yarns or of the plied composite. Likewise, there is absolutely no disclosure relating to the benefits of having the single spun yarn having a higher degree of twist than the plied composite and in the opposite direction.

The secondary reference, Smith et al., that was cited to support the rejection fails significatly in that it does not teach the missing claim elements. Smith et al. is solely directed to synthetic ***elevator rope***, **not** to sewing thread. Moreover, Smith is directed to the use of lubricants and exterior jackets on the rope to improve the resistance to compression and abrasion during repeated use of the rope to lift an elevator **not** to the benefits of varying twits levels. The difference between rope and sewing thread could not be greater. Rope, by its nature, is developed and manufactured to be used contniuosly over and over again, whereas sewing thread is not; it is developed for only a single use. As such, resistance to compression and abrassion during repeated use is not an issue to be considered in developing a sewing thread composition. Once a seam of fabric is sewn with sewing thread, the thread stays in place and is not reused. Another deficiency of Smith et al. is that it is directed ***only*** to the use of continuous filament yarns. Nowhere in Smith et al. is the term "staple fibers" or "spun yarn" mentioned. In contradistinction, Applicant's claimed invention requires that at least one of the two yarns that makes up the 2-ply composite is a twisted spun yarn that comprises 100% staple fibers. Indeed,

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the fact that Aplicant's claims are limited to a 2 ply composite represents another distinction over Smith et al. The Smith et al. reference clearly teaches away from Applicant's invention by disclosing only multi-ply composites, i.e. greater than 2 ply, constrution for the rope whereas Applicant's invention is limited to **only** a 2-ply composite.

Finally, the most glaring deficiency of Smith et al. is that it fails to teach that the individual yarns (item **20** in the figures) that make up the composite rope have a greater degree of twist than the plied composite. In fact, Smith et al. teaches away from Applicant's invention by requiring the "same number of turns per inch", as shown below:

> Each yarn **20** is twisted about its (longitudinal axis between 1 and 6 turns per inch (tpi), and preferably between 2 and 4 tpi, in a counter clockwise direction (denoted by the smaller arrow). The three twisted yarn **20** are then twisted together at the ***same number of turns per inch*** in a clockwise direction (denoted by the larger arrows.

(paragraph 29 of Smith et al. – emphasis added). Clearly, the "same number of turns per inch" is completely contarary to what is being claimed by the Applicant.

In light of the above-mentioned deficiencies, Applicant submits that the combination of Smith et al. with Hatch is improper because Smith et al. is non-analagous art and is solely directed to the construction of a specialized rope for elevators. There is no mention of sewing threads and no mention of spun yarns made of 100% staple fibers in Smith et al. As such, one skilled in the art of developing a sewing thread composition would not consider art directed solely to abrasion and compression resistant industrial ropes relevant, let alone such speciality ropes for hoisting elevators.

Even if the combination of Smith et al. and Hatch was proper, the combination fails to teach all the elements of Applicant's invention. Specifically, the references fail to teach a 2 ply

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composite where at least one yarn is spun yarn that must be at a greater twist level in the opposite direction compared to the level of twist of the plied composite. In fact, the combined teachings of the references teach away from Applicant's invention by requiring that any composite has "the same number of turns per inch" as the individual yarns.

For the above stated reasons, Applicant requests that all outstanding rejections be withdrawn and that a Notice of Allowance for pending claims 1-3 and 7-14 be entered. If the Examiner has any questions, please call the undersigned directly at 312/913-2143.

Respectfully submitted,

McDonnell Boehnen Hulbert & Berghoff

Date: 11/21/05

By: _____

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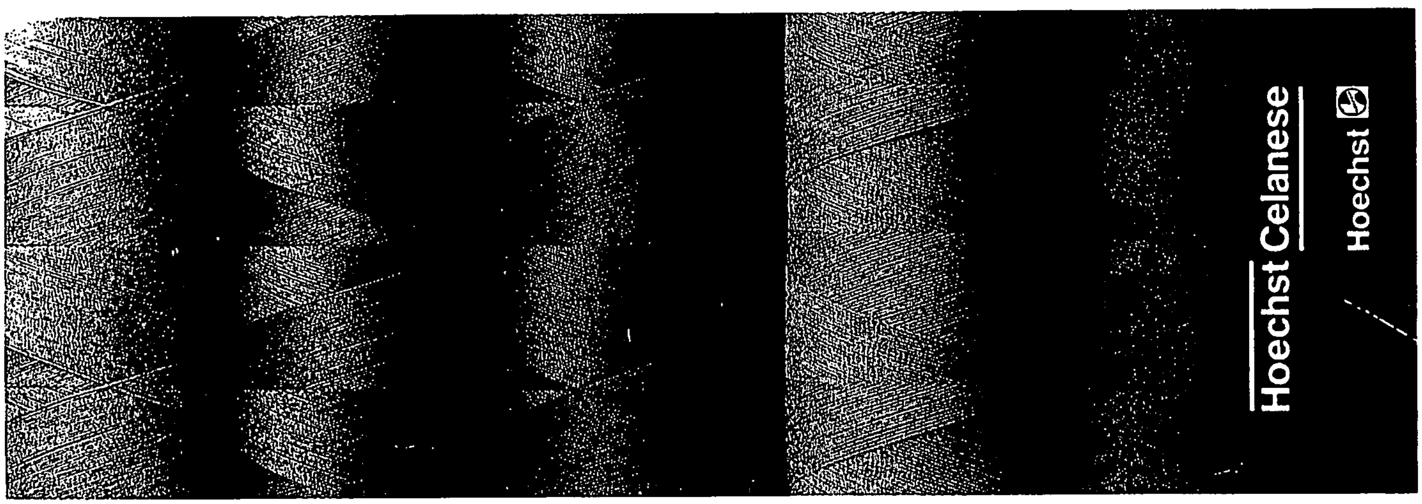

D. Frauchiger

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DELAYED DEFORMATION: Deformation that is time-dependent and is exhibited by material subjected to a continuing load; creep. Delayed deformation may be recoverable or nonrecoverable following removal of the applied load.

DELUSTERING: Subduing or dulling the natural luster of a textile material by chemical or physical means. The term often refers to the use of titanium dioxide or other white pigments as delustrants in textile materials.

DELUSTRANT: A substance that can be used to dull the luster of a manufactured fiber. Often a pigment such as titanium dioxide.

DENIER: A weight-per-unit-length measure of any linear material. Officially, it is the number of unit weights of 0.05 grams per 450-meter length. This is numerically equal to the weight in grams of 9,000 meters of the material. Denier is a direct numbering system in which the lower numbers represent the finer sizes and the higher numbers the coarser sizes. In the U.S., the denier system is used for numbering filament yarns (except glass), manufactured fiber staple (but not spun yarns), and tow. In most countries outside the U.S., the denier system has been replaced by the tex system. The following denier terms are in use:

Denier per Filament (dpf): The denier of an individual continuous filament or an individual staple fiber if it were continuous. In filament yarns, it is the yarn denier divided by the number of filaments.

Yarn Denier: The denier of a filament yarn. It is the product of the denier per filament and the number of filaments in the yarn.

Total Denier: The denier of a tow before it is crimped. It is the product of the denier per filament and the number of filaments in the tow. The total denier after crimping (called crimped total denier) is higher because of the resultant increase in weight per unit length.

DENIER VARIATION: Usually variation in diameter, or other cross-sectional dimension, along the length of a filament or bundle of filaments. It is caused by malfunction or lack of process control in fiber manufacturing and degrades resulting fabric appearance or performance.

DENIM: A firm 2 x 1 or 3 x 1 twill-weave fabric, often having a whitish tinge, obtained by using white filling yarns with colored warp yarns. Heavier weight denims, usually blue or brown, are used for dungarees, work clothes, and men's and women's sportswear. Lighter weight denims with a softer finish are made in a variety of colors and patterns and are used for sportswear and draperies.

DENSITY: The mass per unit volume (usually expressed as grams per cubic centimeter). (Also see SPECIFIC GRAVITY.)

DENT: On a loom, the space between the wires of a reed.

DEREGISTERING (CRIMP): Process of disordering or disaligning the crimp in a tow band to produce bulk. (Also see THREADED-ROLL PROCESS.)

DESULFURIZING: An aftertreatment to remove sulfur from newly spun viscose rayon by passing the yarn through a sodium sulfide solution.

DETERGENT: A synthetic cleaning agent containing surfactants that do not precipitate in hard water and have the ability to emulsify oil and suspend dirt.

DEVELOPED DYES: See DYES.

DEVELOPING: A stage in dyeing or printing in which leuco compounds, dyes, or dye intermediates are converted to the final, stable state or shade.

DEWPOINT: The temperature at which a gas begins to condense as a liquid at a given pressure. Thus in air, it is the temperature at which the air becomes saturated when cooled with no further addition of moisture or change in pressure.

DIAGONAL (45°) FLAME TEST: See FLAMMABILITY TESTS.

DIAL: In a circular-knitting machine, a circular steel plate with radially arranged slots for needles. A knitting machine equipped with both a dial and a cylinder (q.v.) can produce double-knit fabrics.

DIAMINE: A compound with two amino groups. Hexamethylenediamine, one of the intermediates in the manufacture of nylon 66 salt, is an example of this chemical type.

DIELECTRIC BREAKDOWN VOLTAGE: In an electrical insulating material, the voltage at which electrical breakdown occurs, i.e., the voltage at which current will flow and/or the material melts.

DIELECTRIC CONSTANT: Measure of the ability of a dielectric material to store electrical potential energy under the influence of an electric field, measured by the ratio of the capacitance of a condenser with the material as the dielectric to its capacitance with a vacuum as the dielectric.

DIELECTRIC STRENGTH: The average voltage gradient at which electrical failure or breakdown occurs. Expressed in volts per mil.

DIFFERENTIAL THERMAL ANALYSIS: A method of determining the temperature at which thermal events occur in a material undergoing continuous heating.

DIFFUSION: 1. A more or less gradual movement of molecules or ions through a solution or fiber as a result of the existence of a concentration gradient or repulsive or attractive forces. 2. The random movement of gas molecules.

DIMENSIONAL RESTORABILITY: The ability of a fabric to be returned to its original dimensions after laundering or dry cleaning, expressed in percent. For example, 2% dimensional restorability means that although a fabric may shrink more than this in washing, it can be restored to within 2% of its original dimensions by ordinary home pressing methods.